CLAIMS

I claim:

1. A selective silicon etchant, comprising:

at least one of potassium hydroxide or tetramethyl ammonium hydroxide,

at least one additive, wherein the additive comprises at least two of the following physical properties: water-soluble, non-volatile and non-flammable, and

an aqueous environment that comprises at least one solvent or solvent blend.

2. The etchant of claim 1, wherein the at least one additive comprises all three of the physical properties.

3. The etchant of claim 1, wherein the potassium hydroxide is present in solution at less than about 30 weight percent.

4. The etchant of claim 3, wherein the potassium hydroxide is present in solution at less than about 20 weight percent.

5. The etchant of claim 4, wherein the potassium hydroxide is present in solution at less than about 10 weight percent.

6. The etchant of claim 1, wherein the at least one additive comprises a glycol-based compound.

7. The etchant of claim 6, wherein the glycol-based compound is ethylene glycol.

8. The etchant of claim 1, where the at least one additive in present in solution at less than about 75 weight percent.

9. The etchant of claim 8, where the at least one additive in present in solution at less than about 60 weight percent.

10. The etchant of claim 9, where the at least one additive in present in solution at less than about 50 weight percent.

11. The etchant of claim 10, where the at least one additive in present in solution at less than about 30 weight percent.

12. The etchant of claim 1, wherein the at least one solvent or solvent blend comprises water.

13. The etchant of claim 1, wherein the etchant comprises a temperature of less than about 125°C.

14. The etchant of claim 13, wherein the etchant comprises a temperature of less than about 105°C.

15. The etchant of claim 14, wherein the etchant comprises a temperature of less than about 95°C.

16. The etchant of claim 15, wherein the etchant comprises a temperature of less than about 85°C.

17. A method of producing a selective silicon etchant, comprising:

providing at least one of potassium hydroxide or tetramethyl ammonium hydroxide;

providing at least one additive, wherein the additive comprises at least two of the following physical properties: water-soluble, non-volatile and non-flammable;

providing an aqueous environment that comprises at least one solvent or solvent blend; and

blending the at least one potassium hydroxide or tetramethyl ammonium hydroxide with the at least one additive in the aqueous environment in order to form a solution that can be utilized as a selective silicon etchant.

18. The method of claim 17, wherein the at least one additive comprises all three of the physical properties.

19. The method of claim 17, wherein the potassium hydroxide is present in solution at less than about 30 weight percent.

20. The method of claim 19, wherein the potassium hydroxide is present in solution at less than about 20 weight percent.

21. The method of claim 20, wherein the potassium hydroxide is present in solution at less than about 10 weight percent.

22. The method of claim 17, wherein the at least one additive comprises a glycol-based compound.

23. The method of claim 22, wherein the glycol-based compound is ethylene glycol.

24. The method of claim 17, where the at least one additive in present in solution at less than about 75 weight percent.

25. The method of claim 24, where the at least one additive in present in solution at less than about 60 weight percent.

26. The method of claim 25, where the at least one additive in present in solution at less than about 50 weight percent.

27. The method of claim 26, where the at least one additive in present in solution at less than about 30 weight percent.

28. The method of claim 17, wherein the at least one solvent or solvent blend comprises water.

29. The method of claim 17, wherein the etchant comprises a temperature of less than about 125°C.

30. The method of claim 29, wherein the etchant comprises a temperature of less than about 105°C.

31. The method of claim 30, wherein the etchant comprises a temperature of less than about 95°C.

32. The method of claim 31, wherein the etchant comprises a temperature of less than about 85°C.